

Date: ESPOO 05.06.2006Page: 1 (27)Appendices -Number:
No. 1 / 1**66937R1**

Date of handing in: 01.06.2006

Measured by:



Timo Hietala, Test Engineer

Reviewed by:



Jyrki Leino, Manager

SORT OF EQUIPMENT:

WCDMA Base Station RF module

MARKETING NAME:

Nokia Flexi BTS RF module 1.7GHz/2.1GHz

TYPE:

FRIA

MANUFACTURER:

Nokia Corporation

FCC ID:

UAFFRIA-01

CLIENT:

Nokia Corporation

ADDRESS:

P.O.Box 319, FI-90651 OULU, FINLAND

TELEPHONE:

+358 7180 08000

TEST LABORATORY:

NET/IMN Oulu

FCC REG. NO.

411251

REFERENCE:

FCC Part 27, SUBPART L**SUMMARY:**

In regard to the performed tests the equipment under test fulfils the requirements defined in the test specifications, see page 4 for details

The test results are valid for the tested unit only. Without a written permission of Nemko Oy it is allowed to copy this report as a whole, but not partially.

Contents

| | |
|--|----|
| 1. EUT and Accessory Information | 3 |
| 1.1 EUT description | 3 |
| 1.2 EUT and accessories..... | 3 |
| Summary of Test Data | 4 |
| 2. General Equipment Specification | 5 |
| 3. RF Power Output | 7 |
| 4. 99% Occupied Bandwidth..... | 9 |
| 5. Spurious Emissions at Antenna Terminals | 11 |
| 6. Field Strength of Spurious | 16 |
| 7. Frequency stability | 19 |
| 8. List of test equipment..... | 21 |
| 9. Photographs of Test Setup | 22 |
| 10.ANNEX A, TEST DETAILS | 24 |
| 11.ANNEX B, TEST DIAGRAMS..... | 26 |

1. EUT and Accessory Information

1.1 EUT description

The EUT is a WCDMA Base station RF module 1.7GHz/2.1GHz with 2 power amplifiers.

1.2 EUT and accessories

Manufacturer: Nokia
Model: FRIA, s/n: L9062000867
Other Units: System module, FSMB
Transmission module, FTIA

General: All measurements are traceable to national standards.

These tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with FCC Part 27, Subpart L.

| | | | |
|-------------------------------------|----------------------------|-------------------------------------|---------------------|
| <input checked="" type="checkbox"/> | New Submission | <input checked="" type="checkbox"/> | Production Unit |
| <input type="checkbox"/> | Class II Permissive Change | <input type="checkbox"/> | Pre-Production Unit |

THIS TEST REPORT RELATES ONLY TO THE ITEM(S) TESTED.

THE FOLLOWING DEVIATIONS FROM, ADDITIONS TO, OR EXCLUSIONS FROM THE TEST SPECIFICATIONS HAVE BEEN MADE. **NONE**

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This report applies only to the items tested.

Summary of Test Data

| NAME OF TEST | SECTION IN CFR 47 | SPEC. | RESULT |
|---|-------------------|---------------------------------|-----------------|
| RF Power Output | 27.50 (d), 2.1046 | 100 W | Complies |
| 99% Occupied Bandwidth | 2.1049, (i) | Unspecified | Complies |
| Spurious Emissions at Antenna Terminals | 27.53(g), 2.1051 | - 13 dBm | Complies |
| Field Strength of Spurious Emissions | 27.53(g), 2.1053 | - 13 dBm E.I.R.P | Complies |
| Frequency stability | 27.54, 2.1055 | ± 0.05 ppm ¹⁾ | Complies |

Note ¹⁾ Limit is the manufacturer's specification

Measurement uncertainty is expressed to a confidence level of 95%.

2. General Equipment Specification

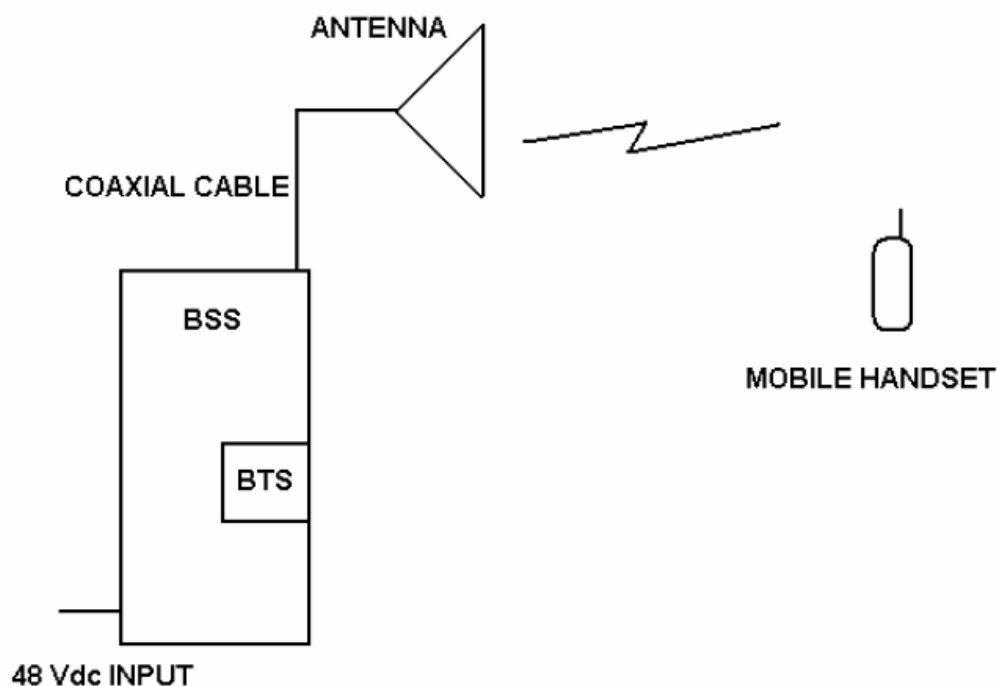
| | | | |
|---|--|--|--|
| Supply Voltage Input: | 48 Vdc | | |
| Frequency Bands: TX: | <input checked="" type="checkbox"/> | Block A : 2110 – 2120 MHz | |
| | <input checked="" type="checkbox"/> | Block B : 2120 – 2130 MHz | |
| | <input checked="" type="checkbox"/> | Block C : 2130 – 2135 MHz | |
| | <input checked="" type="checkbox"/> | Block D : 2135 – 2140 MHz | |
| | <input checked="" type="checkbox"/> | Block E : 2140 – 2155 MHz | |
| Frequency Bands: RX: | <input checked="" type="checkbox"/> | Block A : 1710 – 1720 MHz | |
| | <input checked="" type="checkbox"/> | Block B : 1720 – 1730 MHz | |
| | <input checked="" type="checkbox"/> | Block C : 1730 – 1735 MHz | |
| | <input checked="" type="checkbox"/> | Block D : 1735 – 1740 MHz | |
| | <input checked="" type="checkbox"/> | Block E : 1740 – 1755 MHz | |
| Type of Modulation and Designator: | W-CDMA (5M00F9W) <input checked="" type="checkbox"/> | GSM (200KG7W) <input type="checkbox"/> | NADC 40K0DXW) <input type="checkbox"/> |
| Maximum No. of Carriers: | 1+1 | | |
| Output Impedance: | 50 ohms. | | |
| RF Output: | Per channel: 40 W. | | |
| Band Selection: | Software <input checked="" type="checkbox"/> | Duplexer <input type="checkbox"/> | Fullband <input type="checkbox"/> |

System Description

The BTS performs the radio function of the Base Station System (BSS), and is connected to the Radio Network Controller (RNC) via the Iub interface, and to Mobile Stations (MS) via the Air interface (Antenna). The RNC is further connected to Serving GPRS Support Node (SGSN) or it can be connected to the Mobile Switching Centre (MSC) via IWU (Inter Working Unit).

Setup for testing: The transmitter was set up according to 3GPP TS 25.141 Test Model 1 for all tests except frequency stability. 64 DPCHs at 30 kbps (SF=128) distributed randomly across the code space, at random power levels and random timing offsets, were defined to simulate a realistic operating scenario which may have high PAR (Peak-to-Average Ratio). The transmitter was set up according to 3GPP TS 25.141 Test Model 4 for the frequency stability tests.

System Diagram



3. RF Power Output

NAME OF TEST: RF Power Output **PARA.NO.:** 27.50 (d) & 2.1046**TESTED BY:** Timo Hietala**DATE:** 01/06/2006**Test Results:** Complies.**Measurement Data:** Refer to attached plot.

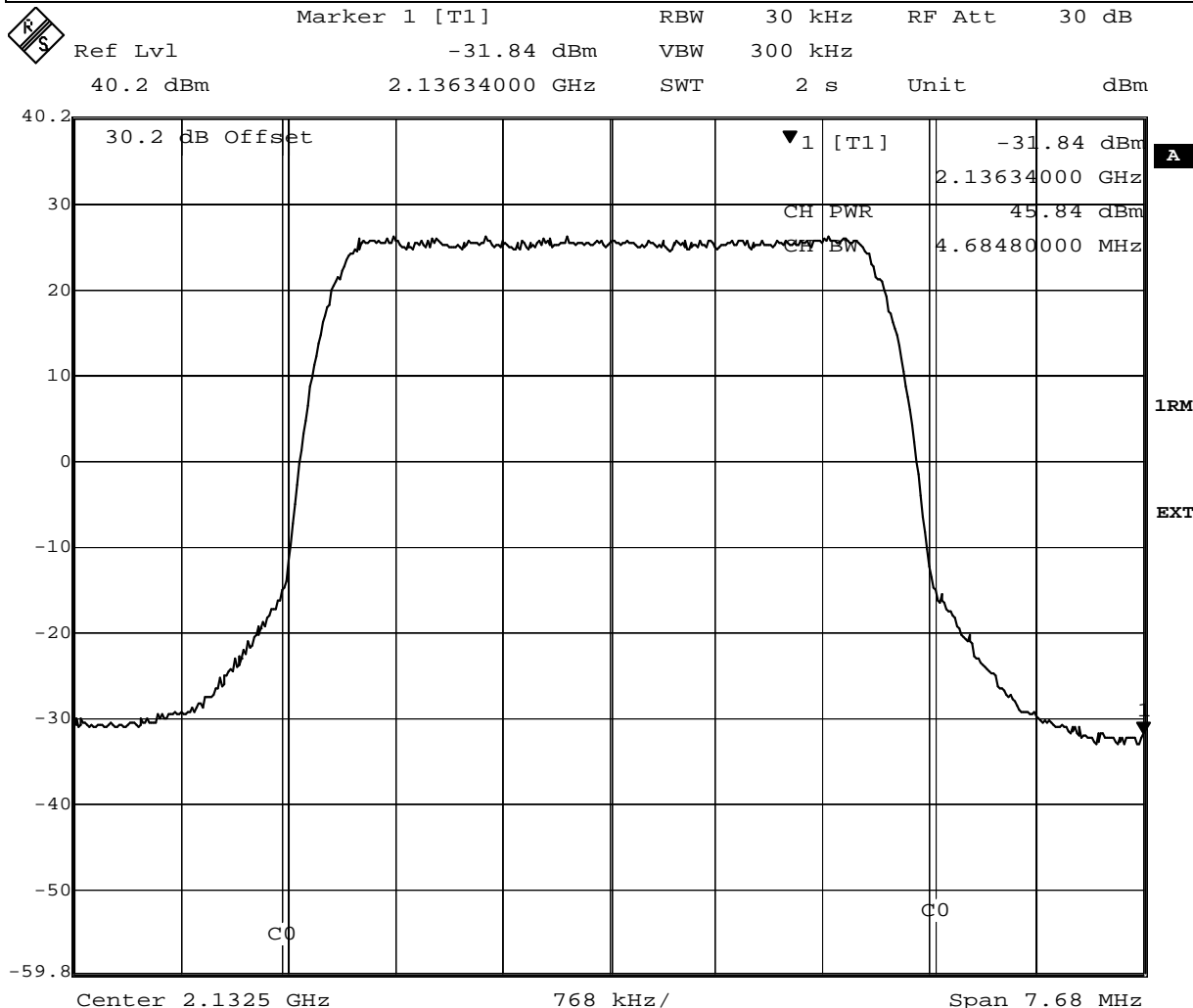
| Modulation Type | Frequency (MHz) | Measured Output | Measured Output |
|-----------------|--------------------|-----------------|-----------------|
| | | Power (dBm) | Power (W) |
| WCDMA | 2112.6 | 45.89 | 38.82 |
| WCDMA | 2132.5 | 45.84 | 38.37 |
| WCDMA | 2152.4 | 45.98 | 39.63 |

Equipment used: 1, 2, 4, 7, 8, 9.**Measurement
Uncertainty:** ± 0.7 dB.**Temperature:** 23 °C.**Relative
Humidity:** 35 %.

Test Data – RF Power Output

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| Data Plot | | RF POWER OUTPUT | | Complete |
|---|--|----------------------------|-----------------|--------------------|
| Page 1 of 1 | | | | <u>x</u> |
| Job No.: 69937 | | Date: 01/062006 | | Preliminary: _____ |
| Specification: PT27 | | Temperature (°C): 23 | | |
| Tested By: Timo Hietala | | Relative Humidity (%): 35 | | |
| E.U.T.: WCDMA TRANSMITTER | | | | |
| Configuration: TX FULL POWER CENTER CHANNEL | | | | |
| Sample Number: 1 | | | | |
| Location: NET/IMN Oulu | | RBW: Refer to plots | Measurement | |
| Detector type: Rms | | VBW: Refer to plots | Distance: N/A m | |
| Test Equipment Used | | | | |
| Antenna: _____ | | Directional Coupler: _____ | | |
| Pre-Amp: _____ | | Cable #1: _____ | | |
| Filter: _____ | | Cable #2: _____ | | |
| Receiver: 1 | | Cable #3: _____ | | |
| Attenuator #1: 7 | | Cable #4: _____ | | |
| Attenuator #2: _____ | | Mixer: _____ | | |
| Additional equipment used: _____ | | | | |
| Measurement Uncertainty: ± 0.7 dB | | | | |



Date: 1.JUN.2006 09:17:19

Notes: _____

4. 99% Occupied Bandwidth

| | |
|---|------------------------------|
| NAME OF TEST: Occupied Bandwidth | PARA.NO.: 2.1049, (i) |
| TESTED BY: Timo Hietala | DATE: 01/06/2006 |

Test Results: Complies.

Test Data: See attached plot(s).

| Modulation Type | Frequency (MHz) | Measured 99% Occupied Bandwidth (MHz) |
|------------------------|----------------------------|--|
| WCDMA | 2132.5 | 3.9679 |

Equipment used: 1, 2, 4, 7, 8, 9.

**Measurement
Uncertainty:** ± 0.7 dB.

Temperature: 23 °C.

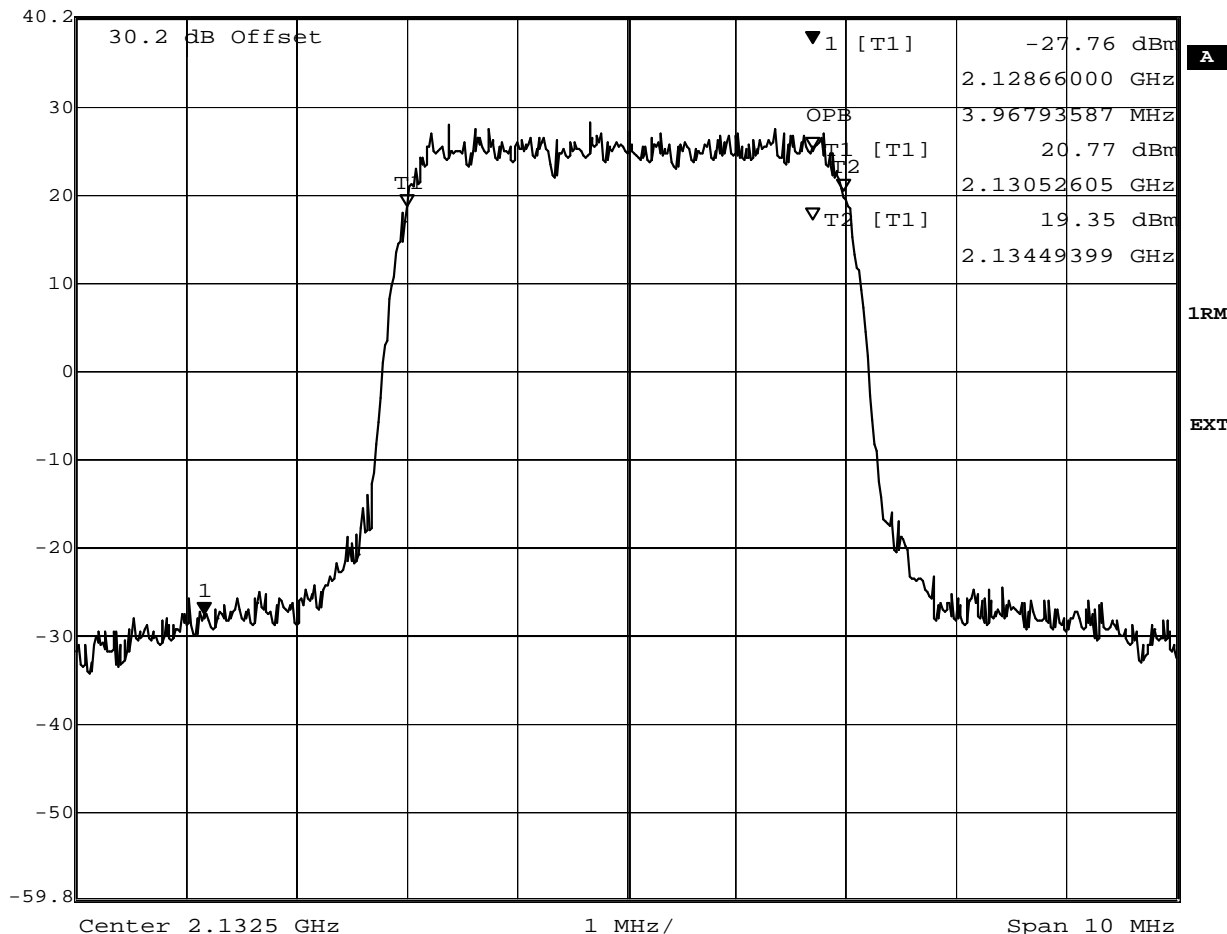
**Relative
Humidity:** 35 %.

Test Data – 99% Occupied Bandwidth

Nemko Oy, Finland

| Data Plot | | 99% Occupied Bandwidth | |
|---|----------------------------|---|---------------------------------------|
| Page 1 of 1 | | | |
| Job No.: 69937 | Date: 01/06/2006 | Complete: <input checked="" type="checkbox"/> | Preliminary: <input type="checkbox"/> |
| Specification: PT27 | Temperature (°C): 23 | | |
| Tested By: Timo Hietala | Relative Humidity (%): 35 | | |
| E.U.T.: WCDMA TRANSMITTER | | | |
| Configuration: TX FULL POWER CENTER CHANNEL | | | |
| Sample Number: 1 | | | |
| Location: NET/IMN Oulu | RBW: Refer to plots | Measurement | |
| Detector type: Rms | VBW: Refer to plots | Distance: N/A | m |
| Test Equipment Used | | | |
| Antenna: _____ | Directional Coupler: _____ | | |
| Pre-Amp: _____ | Cable #1: _____ | | |
| Filter: _____ | Cable #2: _____ | | |
| Receiver: 1 | Cable #3: _____ | | |
| Attenuator #1: 7 | Cable #4: _____ | | |
| Attenuator #2: _____ | Mixer: _____ | | |
| Additional equipment used: _____ | | | |
| Measurement Uncertainty: ±0.7 dB | | | |

| | | | | | | |
|----|----------|----------------|-----|---------|--------|-------|
| RS | Ref Lvl | Marker 1 [T1] | RBW | 30 kHz | RF Att | 30 dB |
| | 40.2 dBm | -27.76 dBm | VBW | 300 kHz | | |
| | | 2.12866000 GHz | SWT | 200 ms | Unit | dBm |



Date: 1.JUN.2006 09:23:26

Notes: _____

5. Spurious Emissions at Antenna Terminals

| | |
|---|-----------------------------------|
| NAME OF TEST: Spurious Emissions @ Antenna Terminals | PARA.NO.: 27.53(g), 2.1051 |
| TESTED BY: Timo Hietala | DATE: 01/06/2006 |

Test Results: Complies.

Test Data: See attached plots.

| Frequency (MHz) | Spurious Emission (dBm) |
|--------------------|----------------------------|
| 1357.8 | -27.8 |
| 4265.0 | -29.4 |
| 6397.5 | -34.0 |

Lower Band Edge

| Frequency (MHz) | Peak Emission Level (dBm) |
|--------------------|------------------------------|
| 2109.433 | -17.5 |

Upper Band Edge

| Frequency (MHz) | Peak Emission Level (dBm) |
|--------------------|------------------------------|
| 2155.106 | -15.3 |

Equipment used: 1, 2, 3, 4, 7, 8, 9, 12, 13, 14

**Measurement
Uncertainty:** ± 0.7 dB.

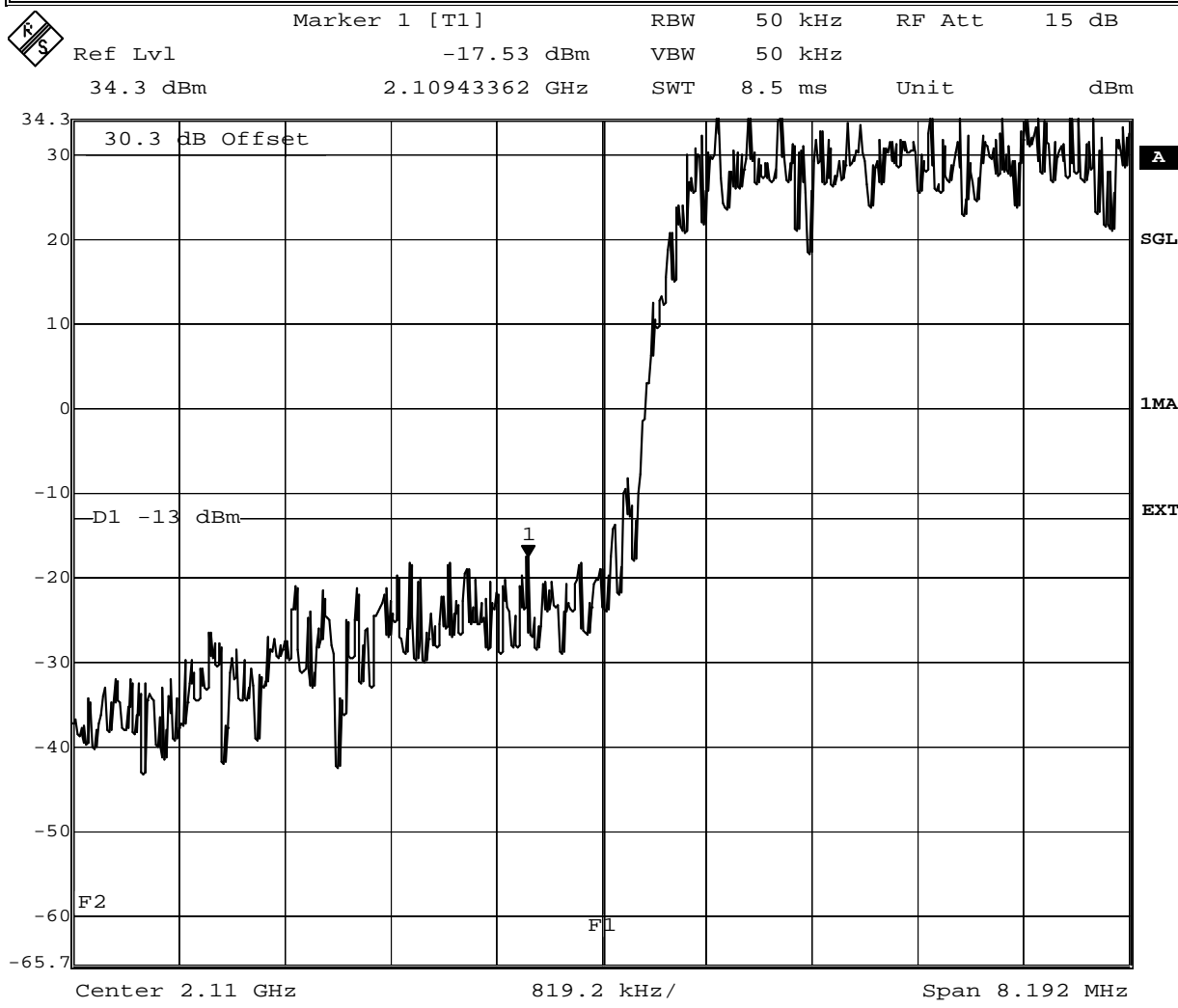
Temperature: 23 °C.

**Relative
Humidity:** 35 %.

Test Data – Spurious Emissions

Nemko Oy, Finland

| Data Plot | | Spurious Emissions at Antenna Terminals | | Complete <u> x </u> |
|--|--|--|--|------------------------------------|
| Page 1 of 4 | | Date: <u>01/06/2006</u> | | Preliminary: <u> </u> |
| Job No.: <u>69937</u> | | Temperature (°C): <u>23</u> | | |
| Specification: <u>PT27</u> | | Relative Humidity (%): <u>35</u> | | |
| Tested By: <u>Timo Hietala</u> | | | | |
| E.U.T.: <u>WCDMA TRANSMITTER</u> | | | | |
| Configuration: <u>TX FULL POWER BOTTOM CHANNEL</u> | | | | |
| Sample Number: <u>1</u> | | | | |
| Location: <u>NET/IMN Oulu</u> | | RBW: <u>Refer to plots</u> | | Measurement Distance: <u>N/A</u> m |
| Detector type: <u>Peak</u> | | VBW: <u>Refer to plots</u> | | |
| Test Equipment Used | | | | |
| Antenna: <u> </u> | | Directional Coupler: <u> </u> | | |
| Pre-Amp: <u> </u> | | Cable #1: <u> </u> | | |
| Filter: <u> </u> | | Cable #2: <u> </u> | | |
| Receiver: <u>1</u> | | Cable #3: <u> </u> | | |
| Attenuator #1: <u>7</u> | | Cable #4: <u> </u> | | |
| Attenuator #2: <u> </u> | | Mixer: <u> </u> | | |
| Additional equipment used: <u> </u> | | | | |
| Measurement Uncertainty: <u>±0.7 dB</u> | | | | |



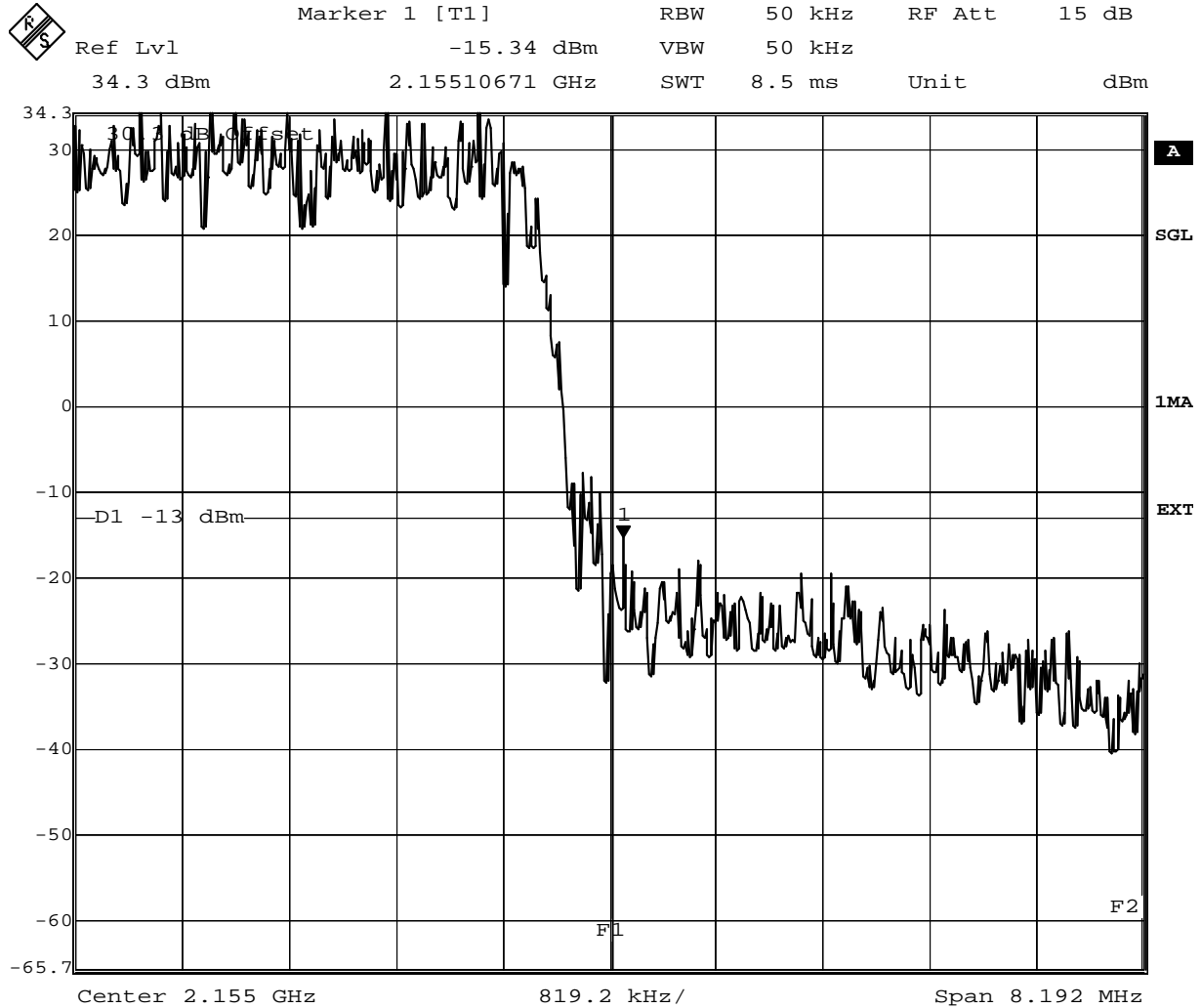
Date: 1.JUN.2006 10:11:33

Notes: LOWER BANDEDGE, Tx 2112.6 MHz

Test Data – Spurious Emissions

Nemko Oy, Finland

| Data Plot | | Spurious Emissions at Antenna Terminals | |
|--|--|--|--|
| Page 2 of 4 | | | |
| Job No.: 69937 | | Date: 01/06/2006 | |
| Specification: PT27 | | Temperature (°C): 23 | |
| Tested By: Timo Hietala | | Relative Humidity (%): 35 | |
| E.U.T.: WCDMA TRANSMITTER | | | |
| Configuration: TX FULL POWER TOP CHANNEL | | | |



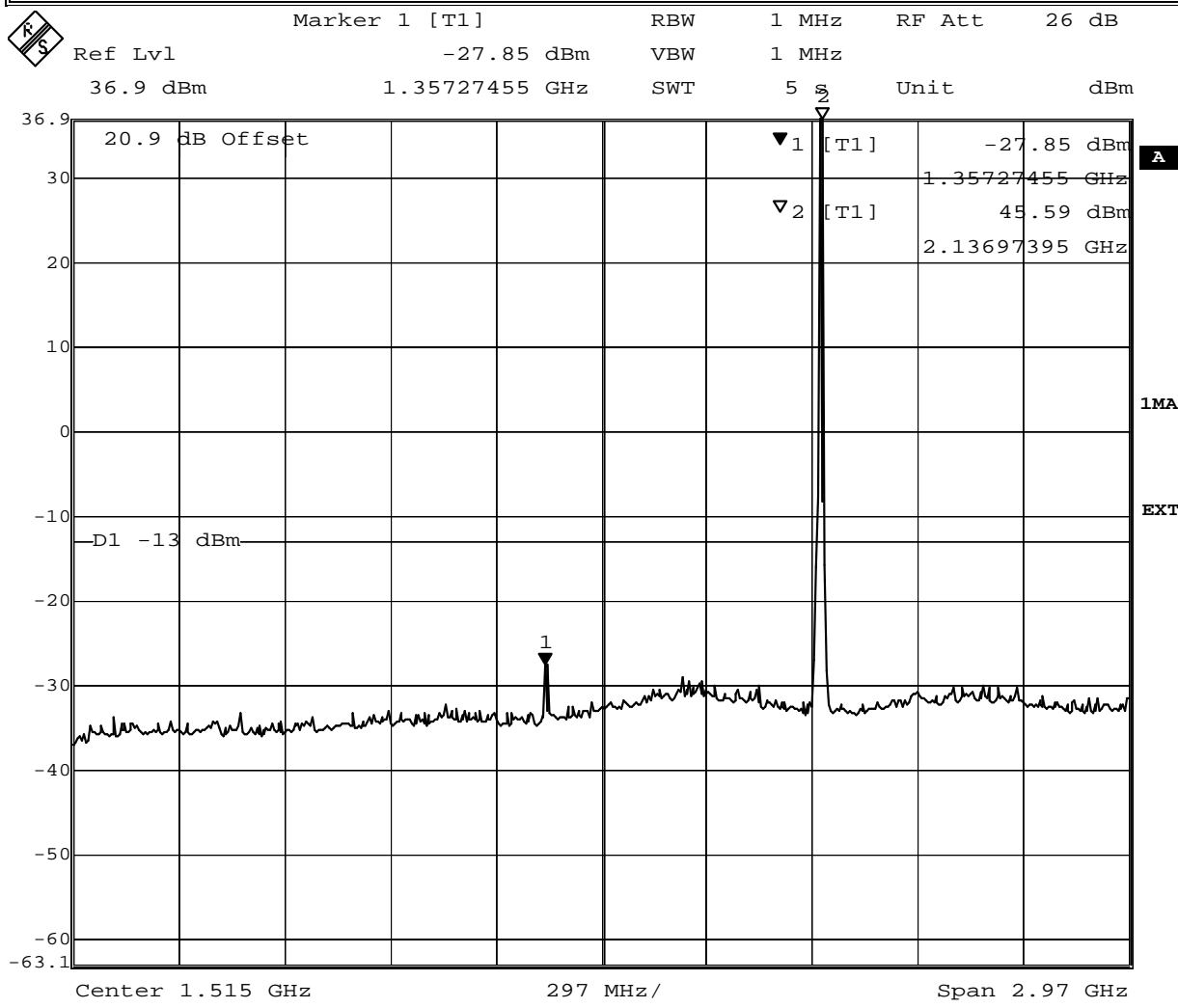
Date: 1.JUN.2006 10:19:40

Notes: UPPER BANDEDGE, Tx 2152.4 MHz

Test Data – Spurious Emissions

Nemko Oy, Finland

| Data Plot | | Spurious Emissions at Antenna Terminals | | Complete <u> x </u> |
|--|--|--|--------------------------------|-----------------------|
| Page <u> 3 </u> of <u> 4 </u> | Job No.: <u> 69937 </u> | Date: <u> 01/06/2006 </u> | Preliminary: <u> </u> | |
| Specification: <u> PT27 </u> | Temperature (°C): <u> 23 </u> | | | |
| Tested By: <u> Timo Hietala </u> | Relative Humidity (%): <u> 35 </u> | | | |
| E.U.T.: <u> WCDMA TRANSMITTER </u> | | | | |
| Configuration: <u> TX FULL POWER MIDDLE CHANNEL </u> | | | | |
| Sample Number: <u> 1 </u> | | | | |
| Location: <u> NET/IMN Oulu </u> | RBW: <u> Refer to plots </u> | Measurement | | |
| Detector type: <u> Peak </u> | VBW: <u> Refer to plots </u> | Distance: <u> N/A </u> m | | |
| Test Equipment Used | | | | |
| Antenna: <u> </u> | Directional Coupler: <u> </u> | | | |
| Pre-Amp: <u> </u> | Cable #1: <u> </u> | | | |
| Filter: <u> </u> | Cable #2: <u> </u> | | | |
| Receiver: <u> 1 </u> | Cable #3: <u> </u> | | | |
| Attenuator #1: <u> 13 </u> | Cable #4: <u> </u> | | | |
| Attenuator #2: <u> </u> | Mixer: <u> </u> | | | |
| Additional equipment used: <u> </u> | | | | |
| Measurement Uncertainty: <u> ± 0.7 dB </u> | | | | |



Date: 1.JUN.2006 11:27:46

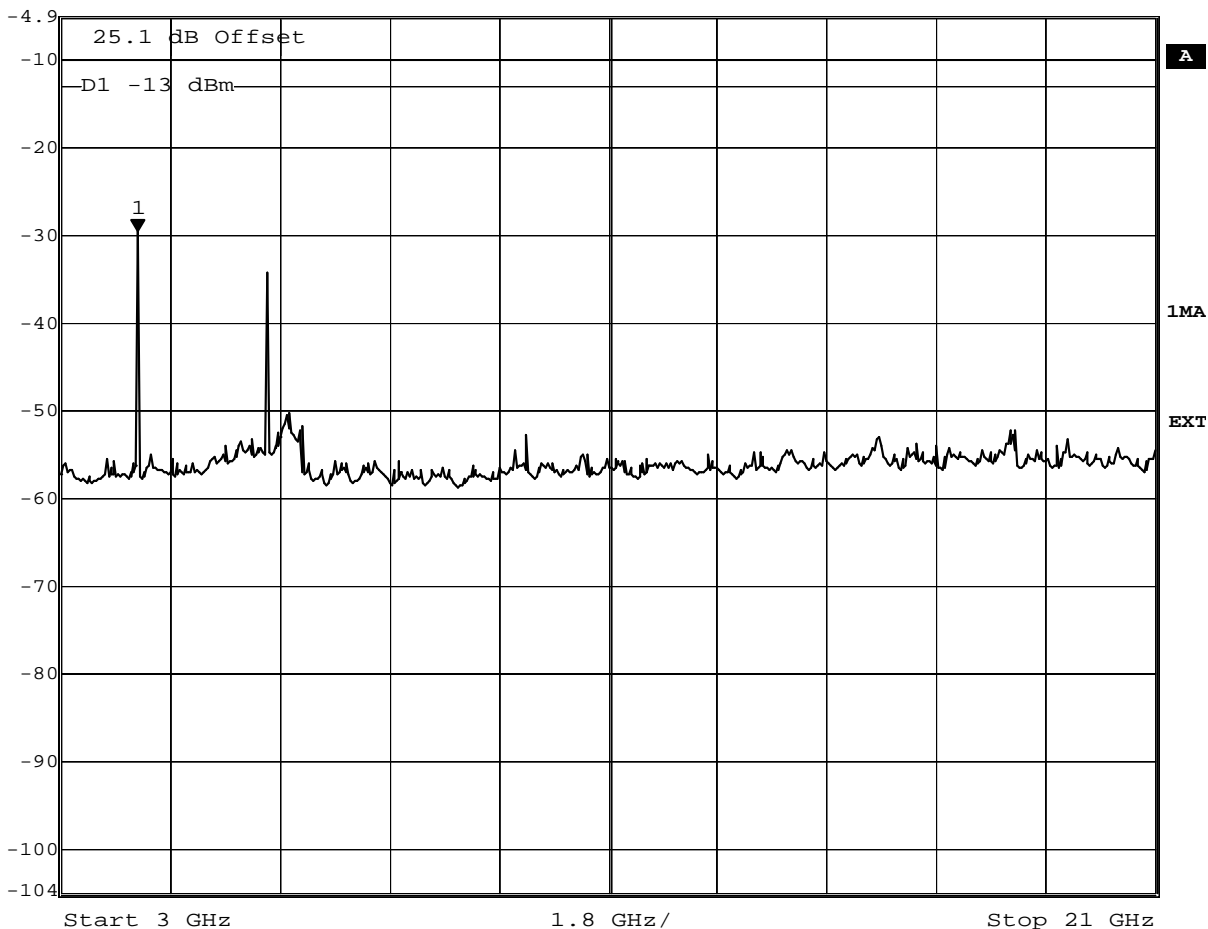
Notes: PA1 Tx 2132.5 MHz

Test Data – Spurious Emissions

Nemko Oy, Finland

| Data Plot | | Spurious Emissions at Antenna Terminals | | Complete <u> x </u> |
|--|--|--|--|------------------------------------|
| Page 4 of 4 | | Date: <u>01/06/2006</u> | | Preliminary: <u> </u> |
| Job No.: 69937 | | Temperature (°C): <u>23</u> | | |
| Specification: PT27 | | Relative Humidity (%): <u>35</u> | | |
| Tested By: <u>Timo Hietala</u> | | | | |
| E.U.T.: <u>WCDMA TRANSMITTER</u> | | | | |
| Configuration: <u>TX FULL POWER MIDDLE CHANNEL</u> | | | | |
| Sample Number: <u>1</u> | | | | |
| Location: <u>NET/IMN Oulu</u> | | RBW: <u>Refer to plots</u> | | Measurement Distance: <u>N/A</u> m |
| Detector type: <u>Peak</u> | | VBW: <u>Refer to plots</u> | | |
| Test Equipment Used | | | | |
| Antenna: <u> </u> | | Directional Coupler: <u> </u> | | |
| Pre-Amp: <u> </u> | | Cable #1: <u> </u> | | |
| Filter: <u> 12</u> | | Cable #2: <u> </u> | | |
| Receiver: <u> 1</u> | | Cable #3: <u> </u> | | |
| Attenuator #1: <u> 14</u> | | Cable #4: <u> </u> | | |
| Attenuator #2: <u> </u> | | Mixer: <u> </u> | | |
| Additional equipment used: <u> </u> | | | | |
| Measurement Uncertainty: <u> ± 0.7 dB</u> | | | | |

| | | | | | | |
|----|----------|----------------|-----|-------|--------|------|
| RS | Ref Lvl | Marker 1 [T1] | RBW | 1 MHz | RF Att | 0 dB |
| | -4.9 dBm | -29.45 dBm | VBW | 1 MHz | | |
| | | 4.26252505 GHz | SWT | 2 s | Unit | dBm |



Date: 1.JUN.2006 11:34:01

Notes: PA1 Tx 2132.5 MHz

6. Field Strength of Spurious**NAME OF TEST:** Field Strength of Spurious Emissions **PARA.NO.:** 27.53(g), 2.1053**TESTED BY:** Timo Hietala**DATE:** 01/06/2006**Test Results:** Complies.**Test Data:** See attached table.

| Frequency (MHz) | Spurious Emission EIRP (dBm) |
|--------------------|---------------------------------|
| 4226 | -30.0 |
| 4265 | -23.6 |
| 4915 | -36.0 |
| 8529 | -42.4 |

Equipment used: 15, 16, 17, 18, 19, 23, 24, 25, 26**Measurement
Uncertainty:** ± 5.2 dB.**Temperature:** 23 °C.**Relative
Humidity:** 35 %.**NOTE:** _____

The spectrum was searched from 30 MHz to the 10th harmonic of the carrier.

Test Data – Radiated Emissions

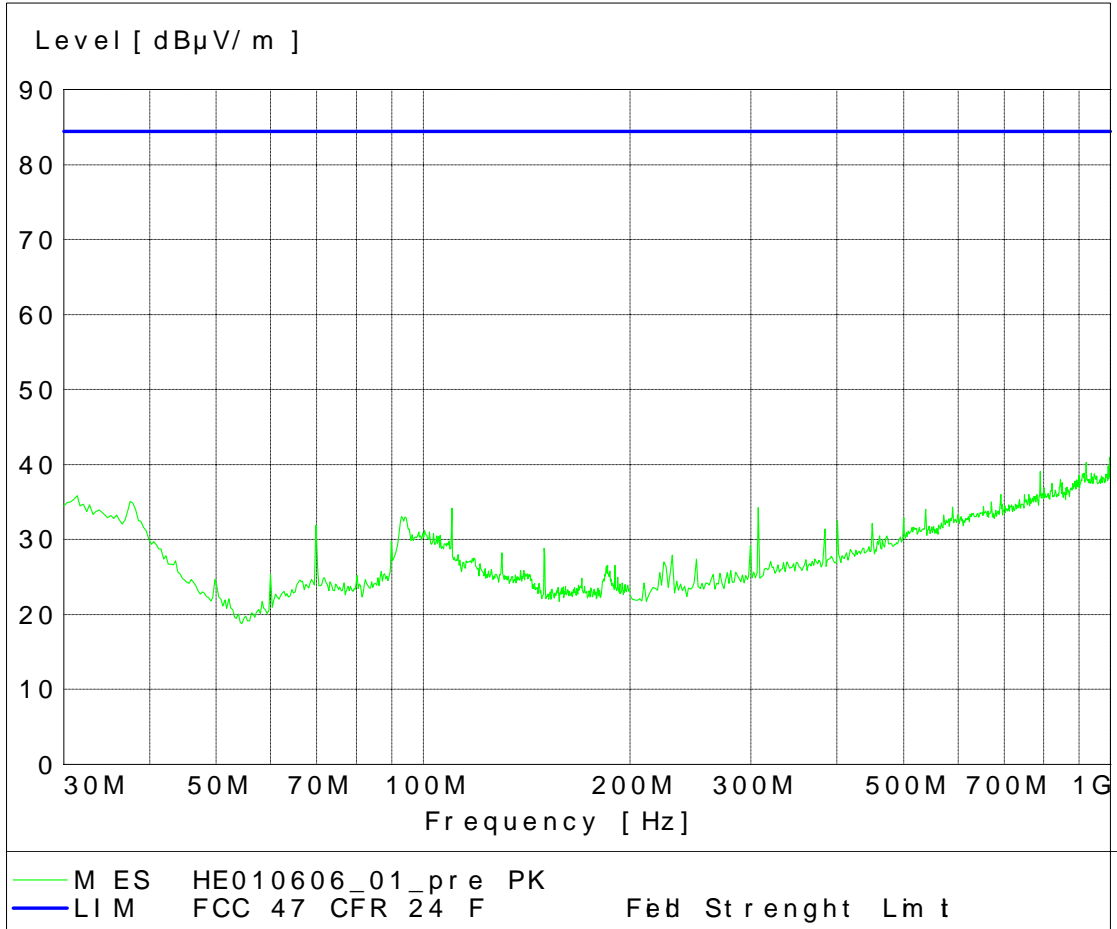
Nemko Oy, Finland

| <u>Data Plot</u> | <u>Radiated Emissions Substitution Method</u> | Complete <u> x </u> |
|---|---|----------------------------------|
| Page 1 of 1 | | Preliminary: <u> </u> |
| Job No.: 69937 | Date: <u>01/06/2006</u> | |
| Specification: PT27 | Temperature (°C): <u>23</u> | |
| Tested By: <u>Timo Hietala</u> | Relative Humidity (%): <u>35</u> | |
| E.U.T.: <u>WCDMA TRANSMITTER</u> | | |
| Configuration: <u>TX FULL POWER MIDDLE and BOTTOM CHANNEL</u> | | |
| Sample Number: <u>1</u> | | |
| Location: <u>NET/IMN Oulu</u> | RBW: <u>1 MHz</u> | Measurement Distance: <u>3</u> m |
| Detector type: <u>Ave</u> | VBW: <u>1 MHz</u> | |
| <u>Test Equipment Used</u> | | |
| Antenna: <u>17 and 18</u> | Directional Coupler: <u> </u> | |
| Pre-Amp: <u>24</u> | Cable #1: <u> </u> | |
| Filter: <u> </u> | Cable #2: <u> </u> | |
| Receiver: <u>16</u> | Cable #3: <u> </u> | |
| Attenuator #1: <u>-</u> | Cable #4: <u> </u> | |
| Attenuator #2: <u> </u> | Mixer: <u> </u> | |
| Additional equipment used: <u>19,23,25 and 26</u> | | |
| Measurement Uncertainty: <u>± 5.2 dB</u> | | |

| Frequency (MHz) | Meter Reading (dBm) | Correction Factor (dB) | Gen. Level (dBm) | Substitution Antenna Gain (dBi) | EIRP (dBm) | EIRP (µW) | Polarity | Comments |
|--------------------|---------------------------|------------------------------|------------------------|---------------------------------------|---------------|--------------|----------|----------|
| 4226 | -60.92 | 16.84 | -23.7 | 10.5 | -30.0 | 0.99 | VER | |
| 4265 | -53.72 | 16.84 | -17.3 | 10.5 | -23.6 | 4.33 | VER | |
| 4915 | -65.82 | 17.39 | -29.6 | 11.0 | -36.0 | 0.25 | VER | |
| 8529 | -85.20 | 19.87 | -34.1 | 11.6 | -42.4 | 0.06 | HOR | |

Notes: PA1 2132.5MHz and PA2 2112.6 MHz
All other indicated spurious were at least 20 dB below the relevant limit.
Searched spectrum to the 10th harmonic of carrier.

Test Data – Radiated Emissions 30 MHz -1000 MHz



Notes: PA1 2132.5MHz and PA2 2112.6 MHz
 . 1)Limit line (84.4 dBuV/m) is converted from substitution limit (-13 dBm) to unit dBuV/m in 3 meter measurement distance.

7. Frequency stability**NAME OF TEST: Frequency stability** **PARA.NO.: 27.54, & 2.1055****TESTED BY: Timo Hietala****DATE: 02/06/2006****Test Results:** Complies.**Standard Test Frequency:** 2132.5 MHz.**Standard Test Voltage:** 48 V DC.**Equipment used:** 1, 5, 6, 7, 8, 9.**EUT:** WCDMA TRANSMITTER.**Configuration:** TX FULL POWER MIDDLE CHANNEL.**Measurement Data:** **Frequency stability with voltage variation.**

| Voltage (V DC) | Temp (°C) | Rated (Hz/ppm) | Deviation (Hz) | Deviation (ppm) |
|----------------|-----------|----------------|----------------|-----------------|
| 48.0 | 20 | 106 / 0.05 | 18 | 0.008633 |
| 55.2 | 20 | 106 / 0.05 | 30 | 0.013965 |
| 40.8 | 20 | 106 / 0.05 | 22 | 0.010242 |

Measurement Uncertainty: ± 0.001 ppm (± 2.0 Hz).**Relative Humidity:** 35 %.

| | |
|--|--------------------------------------|
| NAME OF TEST: Frequency stability | PARA.NO.: 27.54, & 2.1055 |
| TESTED BY: Timo Hietala | DATE: 02/06/2006 |

Test Results: Complies.

Standard Test Frequency: 2132.5 MHz.

Standard Test Voltage: 48 V DC.

Equipment used: 1, 5, 6, 7, 8, 9.

EUT: WCDMA TRANSMITTER.

Configuration: TX FULL POWER MIDDLE CHANNEL.

Measurement Data: Frequency stability with temperature variation.

| Voltage (V DC) | Temp (°C) | Rated (Hz/ppm) | Deviation (Hz) | Deviation (ppm) |
|----------------|-----------|----------------|----------------|-----------------|
| 48.0 | 50 | 106 / 0.05 | -11 | -0.00516 |
| 48.0 | 40 | 106 / 0.05 | 19 | 0.00891 |
| 48.0 | 30 | 106 / 0.05 | 48 | 0.022509 |
| 48.0 | 10 | 106 / 0.05 | 56 | 0.02626 |
| 48.0 | 0 | 106 / 0.05 | 65 | 0.030481 |
| 48.0 | -10 | 106 / 0.05 | 65 | 0.030481 |
| 48.0 | -20 | 106 / 0.05 | 81 | 0.037984 |
| 48.0 | -30 | 106 / 0.05 | 92 | 0.043142 |

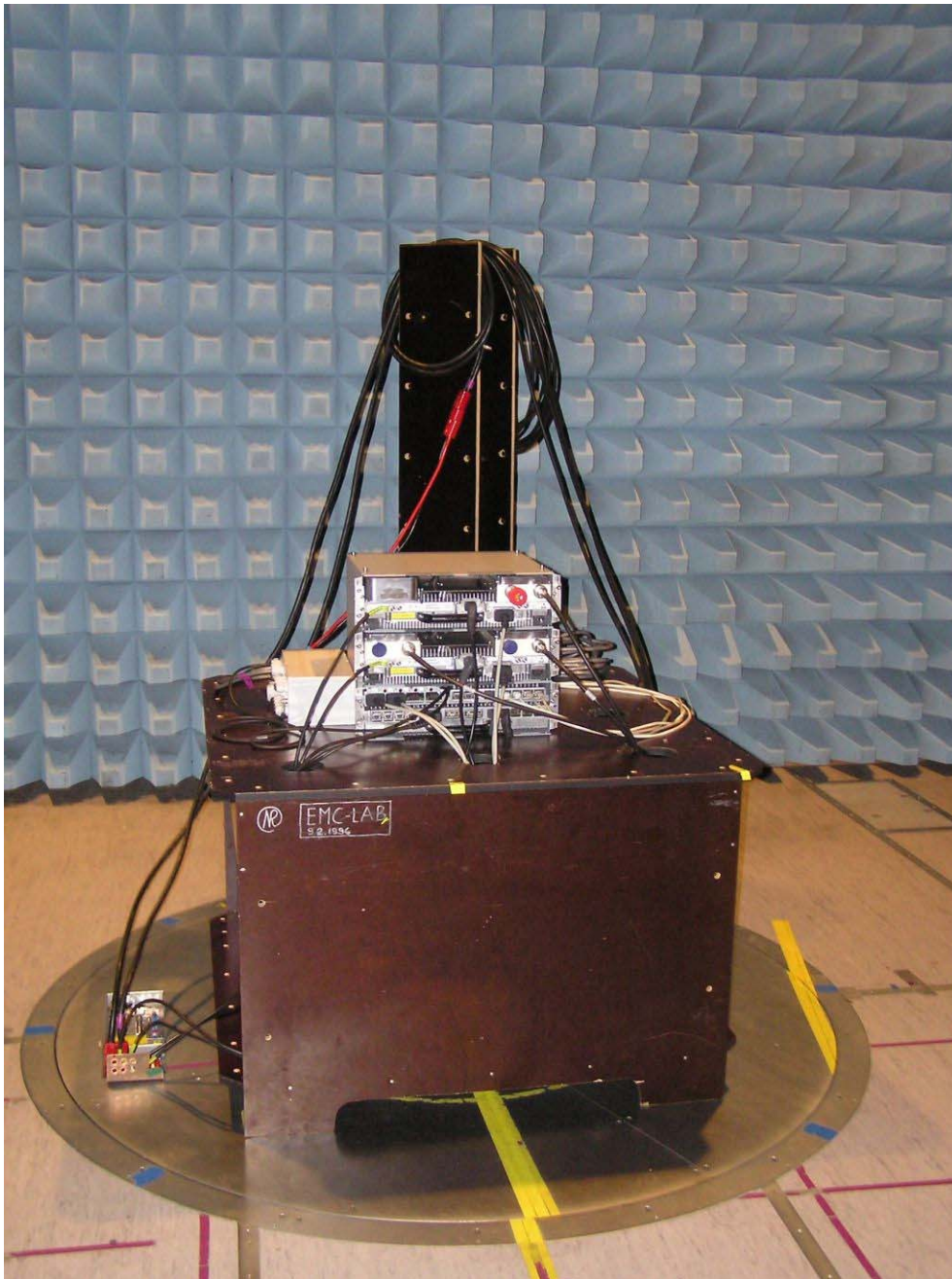
Measurement Uncertainty: ± 0.001 ppm (± 2.0 Hz).

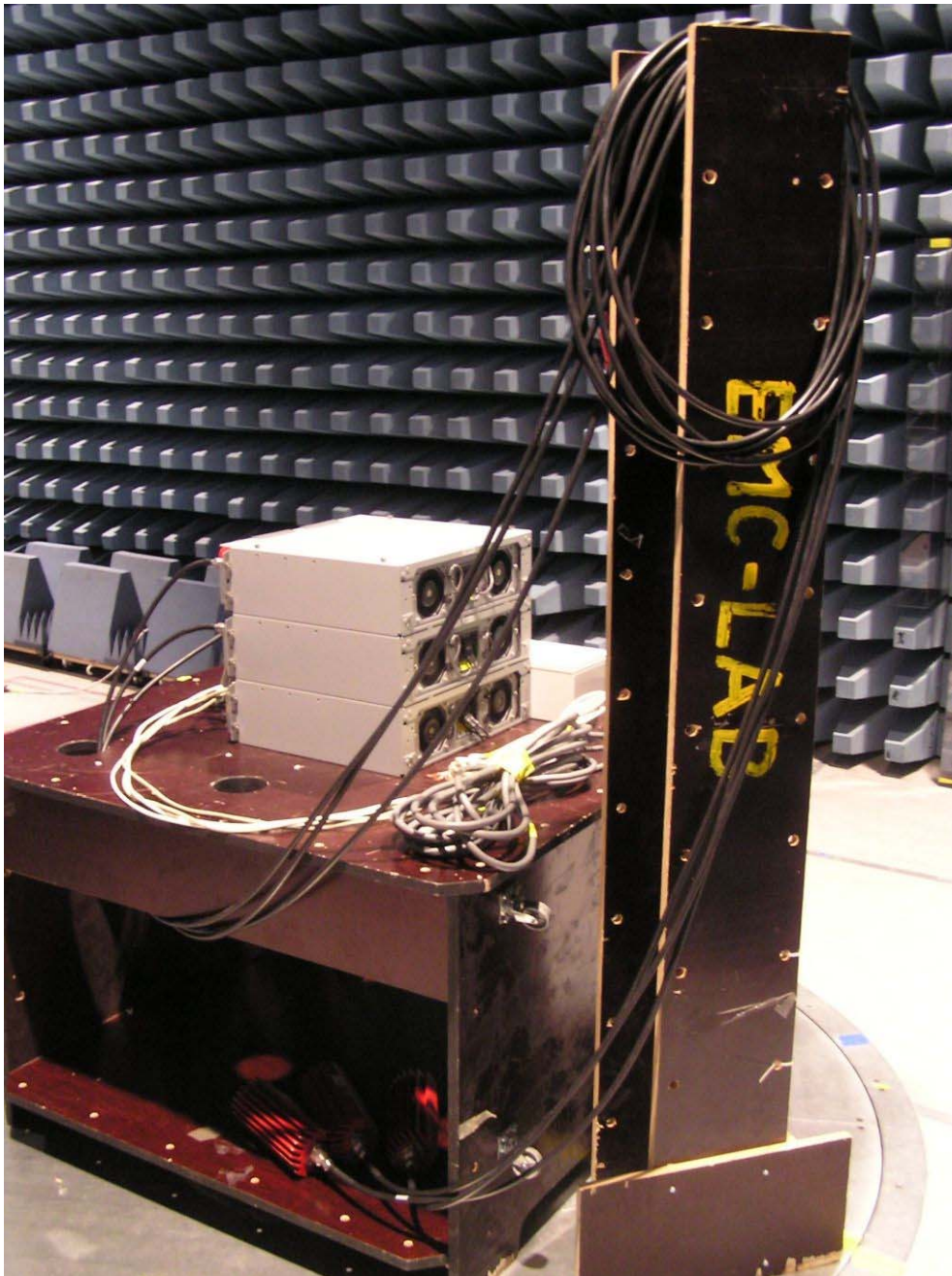
8. List of test equipment

Each active test equipment is calibrated annually.

| Nr. | Equipment | Name of equipment | Serial number |
|-----|----------------------------|---|---|
| 1 | Signal analyzer | Rohde & Schwarz:FSIQ26 | 836702/020 |
| 2 | Network analyzer | Hewlett-Packard:HP8753E | US38431868 |
| 3 | Network analyzer | Hewlett-Packard:HP8720ES | US39172107 |
| 4 | Calibration kit | Hewlett-Packard:HP85032B | 2919A04843 |
| 5 | Environmental chamber | Weiss technick | 59226012320010 |
| 6 | Frequency standard | Datum 8040 | 23006282 |
| 7 | Interface Unit | Orbis TX SSU2100A | SSU-0346-999 |
| 8 | DC power | Sørensen | 9950C0085 |
| 9 | Temperature/humidity meter | VAISALA HMI 31 | P3730008 |
| 10 | Signal analyzer | Rohde & Schwarz:FSIQ26 | 833370/009 |
| 11 | Frequency standard | Datum 8040 | 0041005473 |
| 12 | High Pass filter | Reactel 9HSX-3/20-S11 | 0531 |
| 13 | Attenuator | MCE/Weinschel 67-20-33 | BM0633 |
| 14 | Attenuator | MCE/Weinschel 66-20-34 | BM6886 |
| 15 | Semianechoic chamber | Siemens Matsushita 9m × 5m × 6m (room 0039) | Product No S&M B83317- C6019-T232 |
| 16 | EMI Test Receiver | R&S ESIB 26 | 100335 |
| 17 | LogPer Antenna | R&S HL025 | 349048/002 (1-26 GHz) |
| 18 | Bilog Antenna | Chase CBL6112B | 2694 |
| 19 | Horn Antenna | Emco 3115 | 0102A06346 |
| 20 | Biconical Antenna | R&S HK116 | 836891/009 |
| 21 | Dipole VHF | Mess-Elektronik VHA9103 | |
| 22 | Dipole UHF | Mess-Elektronik UHA9105 | |
| 23 | Signal Generator | R&S SMR 20 | 1715 |
| 24 | Amplifier | Miteq AFSX4 | 791117 |
| 25 | Antenna Mast | Deisel HD240 | 2401323194 |
| 26 | Mast Controller | Deisel HD100 | 1001331 |

9. Photographs of Test Setup





10. ANNEX A, TEST DETAILS

| | |
|--------------------------------------|--------------------------|
| NAME OF TEST: RF Power Output | PARA. NO.: 2.1046 |
|--------------------------------------|--------------------------|

Minimum Standard: Para. No. 27.50 (d). Base stations are limited to 1640 watts peak E.I.R.P. with an antenna height up to 300 meters HAAT. In no case may the peak output power of a base station transmitter exceed 100 watts.

Method Of Measurement:

CDMA Per ANSI/J-STD-014
TDMA Per ANSI/J-STD-010

Detachable Antenna:

The peak power at antenna terminals is measured using an in-line peak power meter or a spectrum analyzer.

| | |
|---|--------------------------|
| NAME OF TEST: Occupied Bandwidth | PARA. NO.: 2.1049 |
|---|--------------------------|

Minimum Standard: Para. No. 2.1049. The 99% occupied bandwidth is the width of a frequency band such that, below the lower and above the upper frequency limits, the mean powers emitted are each equal to 0.5% of the emitted power.

Method Of Measurement:

The 99% occupied bandwidth of the carrier emission is measured using a spectrum analyzer with Resolution Bandwidth set to 1% of the necessary bandwidth of the transmitted carrier.

| | |
|---|--------------------------|
| NAME OF TEST: Spurious Emission at Antenna Terminals | PARA. NO.: 2.1051 |
|---|--------------------------|

Minimum Standard: Para. No. 27.53(g). On any frequency outside a licensee's frequency block, the power of any emission shall be attenuated below the transmitter power by at least $43 + 10 \log (P)$ dB.

Method Of Measurement:

Spectrum analyzer settings:

RBW: 1 MHz

VBW: 1 MHz

Within 1 MHz of the upper and lower edges of the assigned band of operation the resolution bandwidth is lowered to 1 % of the 26 dB occupied bandwidth of the transmitted carrier.

NAME OF TEST: Field Strength of Spurious Radiation**PARA. NO.: 2.1053**

Minimum Standard: Para. No.227.53(g). On any frequency outside a licensee's frequency block, the power of any emission shall be attenuated below the transmitter power by at least $43 + 10 \log (P)$ dB.

Test Method:

TIA/EIA-603-1992, Section 2.2.12

The antenna substitution method was used to determine the equivalent radiated power at spurious frequencies. The spurious emissions were measured at a distance of 3 meters. The EUT was then replaced with a reference substitution antenna with a known gain referenced to an isotropic. This antenna was fed with a signal at the spurious frequency. The level of the signal was adjusted to repeat the previously measured level. The resulting eirp is the signal level fed to the reference antenna corrected for gain referenced to an isotropic.

NAME OF TEST: Frequency Stability**PARA. NO.: 2.1055**

Minimum Standard: Para. No. 27.54. The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

Method Of Measurement:Frequency Stability With Voltage Variation

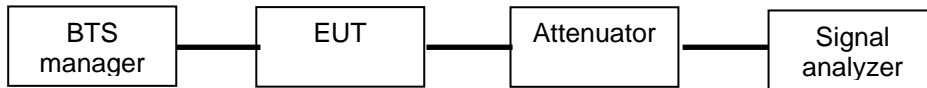
The E.U.T. is placed in an environmental chamber and allowed to stabilize at +20 degrees Celsius for at least 15 minutes. With the voltage input to the E.U.T. set to 85% S.T.V., the frequency error is measure. This procedure is repeated at 100% S.T.V. and 115% S.T.V.

Frequency Stability With Temperature Variation

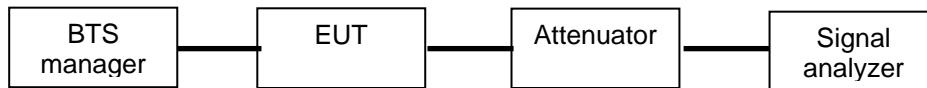
The input voltage to the E.U.T. is set to S.T.V. and the temperature of the environmental chamber is varied in 10 degree steps from -30 degrees C to +50 degrees C. The E.U.T. is allowed to stabilize at each temperature and the frequency error is measured.

11. ANNEX B, TEST DIAGRAMS

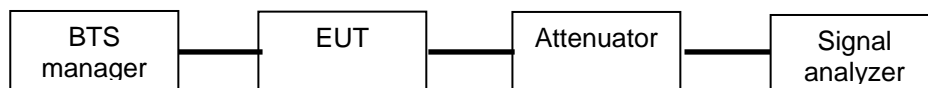
RF Power Output PARA. NO.: 2.1046



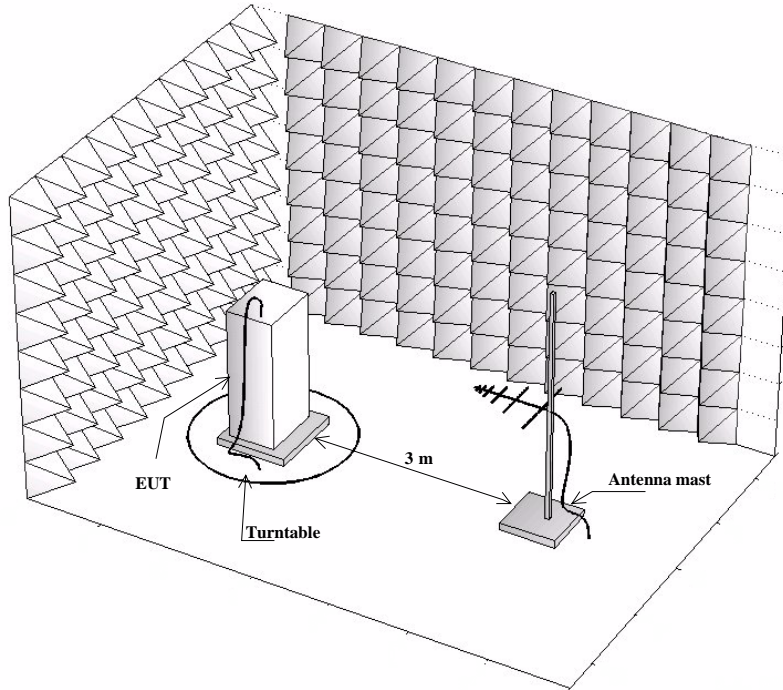
Occupied Bandwidth PARA. NO.: 2.1049



Spurious Emission at Antenna Terminals PARA. NO.: 2.1051

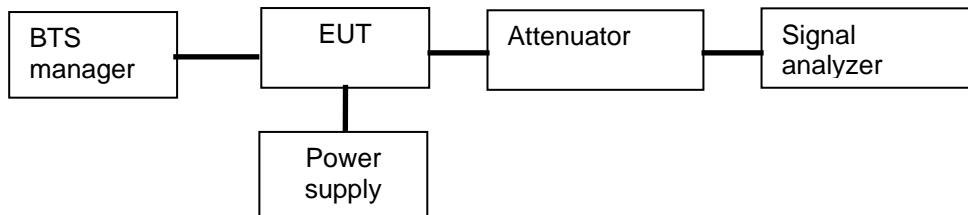


Field Strength of Spurious Radiation PARA. NO.: 2.1053



Frequency Stability PARA. NO.: 2.1055

Frequency Stability With Voltage Variation



Frequency Stability With Temperature Variation

